

SWIM Connect 2014 Get Plugged In...

Aircraft Access to SWIM IP Data Link Demonstrations

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Federal Aviation
Administration

SWIM
connect2014
GET PLUGGED IN...



What is AAtS?

Aircraft Access to SWIM (AAtS)

- Using an IP Data Link to perform functions and collaborate/coordinate flight activities
- Establishes airborne component of ground based SWIM Service Oriented Architecture (SOA)
- Facilitates exchange of advisory level information among pilots and other National Airspace System (NAS) users
- Facilitates a commonly sourced/shared aviation information environment for collaborative decision making
- Leverages existing air/ground third party service providers' infrastructure and technologies
- Supports global interoperability/harmonization with similar systems/capabilities

Aircraft Access to SWIM



DMS = Data Management Service

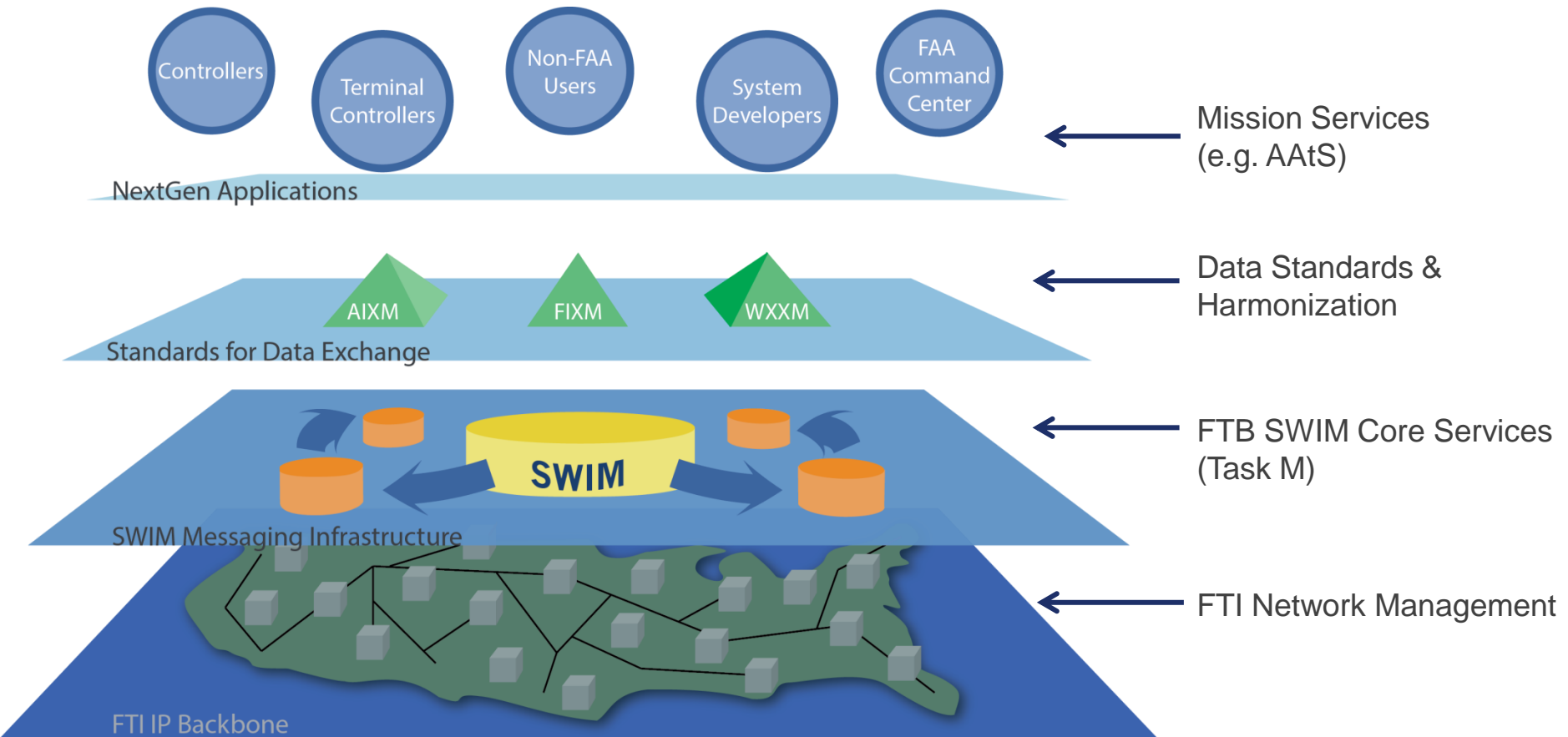
NextGEN

2015/2016 AAtS Objective



Enterprise Data to Aircraft

AAtS focuses on Mission Services to provide data to aircraft



AAtS Activities

Concept definition:

- AAtS Concept of Operations Update (Uplink/Downlink)
- Revised AAtS Technical Concept to include Uplink and Downlink of Information
- AAtS Shortfall Analysis

Technical investigations:

- Security Aspects, Data Priority and Preemption, Wired vs. Wireless Connectivity, Uplink/Downlink Validation, & Interoperability/Standards Harmonization

AAtS Operational Demonstrations

- Conducting live operational flight demonstrations of information uplink
 - Corporate/business aircraft
 - Domestic/commercial aircraft

Other Related Activities

AAtS is involved and/or coordinating with other similar efforts to deliver information to aircraft

- Developing operational concepts/technical aspects to create a seamless sharing/exchange information environment between providers and users of NAS information

- Examples include:

RTCA SC-206 – AIS and MET data link (developing recommendations and standards for use by the FAA)

AEEC 830 – Air Ground Information Exchange (developing an aviation industry standard)

SESAR – SWIM Air Ground (the European version of AAtS)

AAtS Demonstrations

✓NAS to Aircraft Data Distribution (Phase1) - **COMPLETE**

- Traditional Uplink of SWIM Enabled NAS Services Data via DMS Consumption (Outbound from NAS)
- Conforms to Existing and Developing Data Link Operational Use Policies, Processes and Standards

NAS and Aircraft Data Exchange (Phase 2)

- SWIM Enabled NAS Services Exchange Information with the DMS Across the SOA Infrastructure

Both Outbound From and Inbound To the NAS

- DMS Becomes Provider of Aircraft Generated Information
- Includes NAS to Aircraft Data Distribution
- Data link Operational Uses, Policies, Processes and Standards Are Being Developed

AAtS Demonstration Teams

Business Jet (14 CFR Part 135/91)

Commercial Airline (14 CFR Part 121)

Miscellaneous

- N47 FAA Test Aircraft Demonstrations
- Table Top Simulations

AAtS Implementation Guidance

Implementation Guidance Document is:

- Not a draft working paper (i.e., can be referenced)
- Available publicly for comments/questions/suggestions

Implementation Guidance Document allows:

- Operators and vendors to begin planning their implementations
- FAA to plan future guidance/regulation (if necessary)
- Industry standards groups to reference the document's concepts

AAtS Architecture & Components

- NextGen Prototyping Network (NPN)
 - Utilizes a Private Multi-Protocol Label Switching (MPLS) Cloud Service
- NAS Thread Capability
 - Includes data products available from FAA R&D Domain
 - Utilizes the R&D Domain Enterprise Messaging Service
- AAtS Data Management Service (DMS)
 - Utilizes the Advanced Messaging Queuing Protocol (AMQP)
- Data Link Service Provider (DLSP)
 - Can either be terrestrial based or satellite based
 - AirCell, GoGo, Panasonic, Row 44, Iridium, Inmarsat
- Aircraft Equipment
 - Electronic Flight Bag (EFB) Device
 - Apple iPad, NavAero (Windows XP)
 - Jeppesen Flight Deck Pro Application
- AOC/FOC

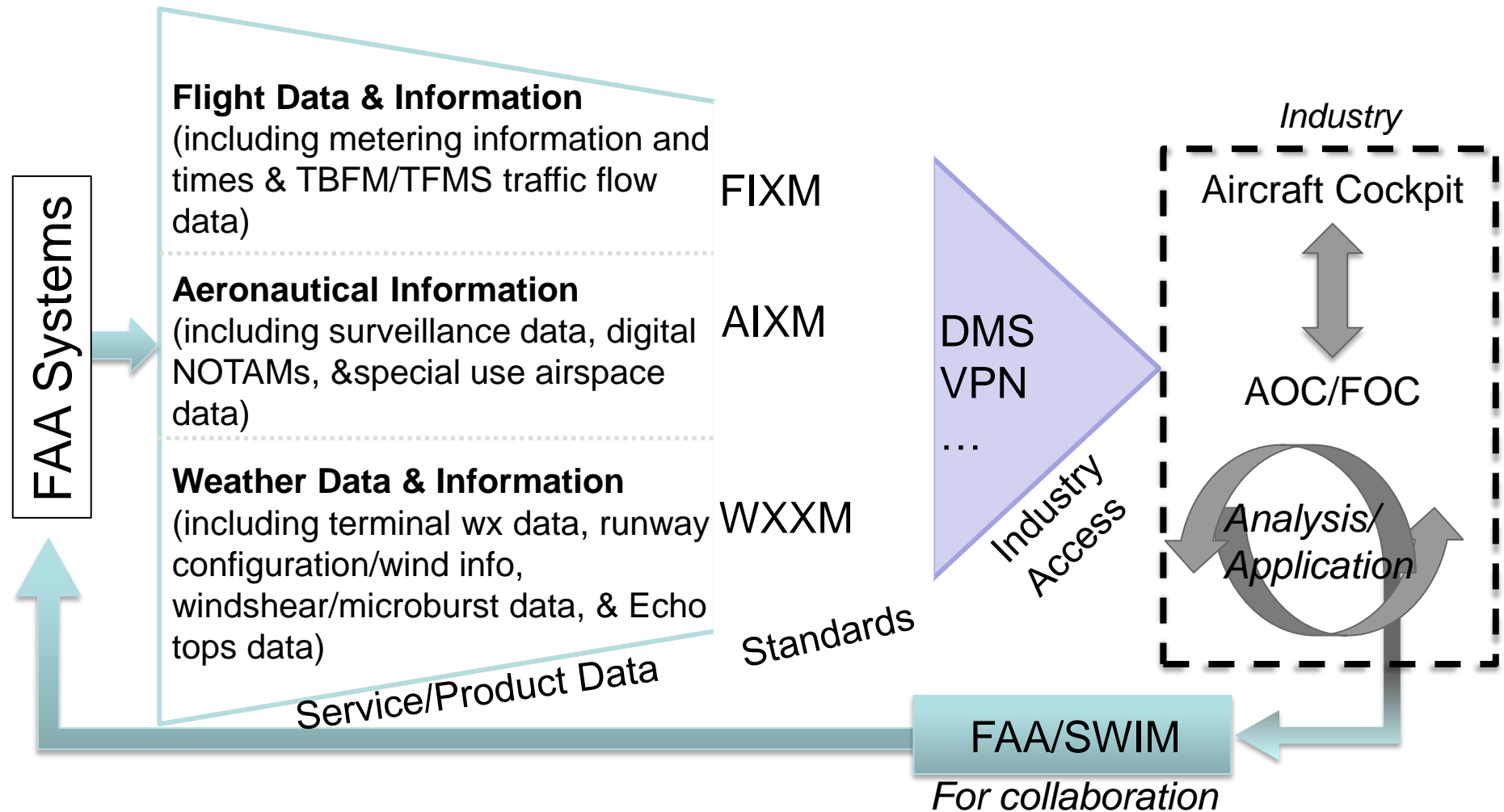
DMS Functional Requirements

- Specify Structure Data Models
- Ability to Dynamically Specify and (Re)Configure Data Flows
- Ability to Describe Delivery Requirements per Data Flow
- Ability to Specify and Control Middleware Resources
 - i.e. Queues and Buffering
- Resiliency to Individual Node or Participant Failures
- Performance and Scalability with Respect to Number of Nodes, Participants, and Data Flows

AAtS Demonstration - DMS Products

- CSS-Wx Data Products
 - METARs (Routine Aviation Meteorological Report)
 - TAFs (Terminal Aerodrome Forecast)
 - NEXRAD (Doppler Radar)
 - PIREP (Pilot Reports)
 - AIRMET/SIGMET (Airmen's Meteorological Information / Significant Meteorological Information)
 - Terminal Wind Forecast
 - Terminal Icing Probability and Severity Forecast
- Aeronautical Information Management (AIM)
 - NOTAMs

AAtS Supporting Collaboration



Electronic Flight Bag (EFB) Application(s)

- Device(s) Being Used: Apple iPad & NavAero
- Operating System(s): Apple iOS & Microsoft Windows, respectively
- Products:
 - METARs (Routine Aviation Meteorological Report)
 - TAFs (Terminal Aerodrome Forecast)
 - NEXRAD (Doppler Radar)
 - PIREP (Pilot Reports)
 - AIRMET/SIGMET (Airmen's Meteorological Information / Significant Meteorological Information)
 - NOTAM (Notices to Airmen)
 - Terminal Wind Forecast
 - Terminal Icing Probability and Severity Forecast

Operations Control Center (OCC)

- Web portal interface
- Create aircraft records (Flight #)
- Subscribe/Unsubscribe products
- Create profiles
 - ✦ Includes subscriptions for products (METARs, TAFs, AIRMETs, SIGMETs, etc.)
- Apply specific profiles to any aircraft
- Synchronization view

AAtS Certification Need-To-Knows

AAtS One-Way Consumption of Information is Ready

- The Fusing of Products from Other Public Entities with FAA Data Must Comply with A10

AAtS IP Data Link is Application Dependent

- Regulations Have Not Been Thoroughly Determined

Approvals may be needed for:

- Training
- Data Storage
- Users

A 'Data Source' Amendment, if the Data is Coming Directly from the FAA, is Not Necessary

AAtS Certification References

Electronic Flight Bag Advisory Circular – 120.76C

Aeronautical Information Data Link Advisory Circular – 00-63A

8900.1 Volume 3, Chapter 26

- Sections 1-4: Information Sources
- Section 5: Use of Flight Information Services on the Flight Deck

Notice 8900.240 – Expanded Use of Personal Electronic Device (PED)

- Improves Feasibility of EFB Use

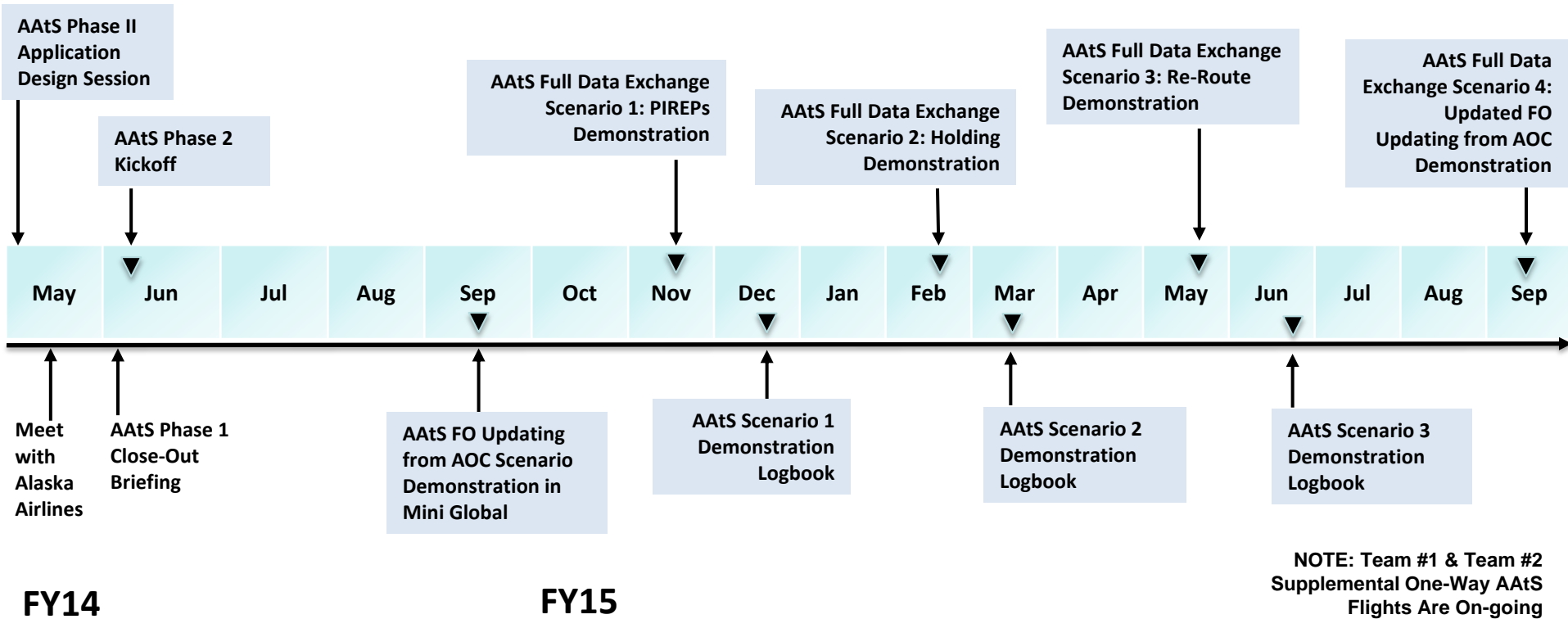
IP Data Link

Concept Scenarios

Flight Object Exchange and Updating from AOC
Pilot Report(s) (PIREPs) Exchange
Operator Preference Publishing
Alternative Routing Query
Automated Flight Status Reports
Airline /Air Carrier Operations Information Exchange
Moving TFRs

Phase 2

Aircraft Access to SWIM (AAtS)



▼ = AAtS Deliverable

Team #1 (Business Jet Partners): *FLEXJET, Boeing Corporate, N47*
CFR Part 91, 91K, 135

Team #2 (Commercial Air Carrier): *Virgin America, United Airlines, Alaska Airlines*
CFR Part 121

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